Flattening the Military Force Structure

A Monograph
By
Major James D. Nickolas
Armor

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

Second Term AY 99-00

20000919 062

ABSTRACT

FLATTENING THE MILITARY FORCE STRUCTURE by MAJ James D. Nickolas, Armor, 50 pages.

As western civilization evolved from a pre-industrial to an industrial society, social and technological changes transformed the structure and *modus operandi* of political, economic, and military institutions. With the dawning of the 21st century and the Information Revolution, western society and her militaries once again face tremendous changes. This SAMS monograph examines how technological advances provide opportunities to flatten the current army force structure.

Viewing change through the lens of organizational theory, the monograph traces the historical development of the two fields of study - organizational behavior/development and management/leadership - that evolved into this new academic discipline. Through this lens, the study examines the Newtonian nature of the current Industrial Era society and outlines how organizational theorists envision Quantum and Chaos theories impact 21st century organizational design and operations. Having established the Newtonian nature of the Industrial Era society, the monograph illustrates how current military structures and operations reflect this same Newtonian influence. The remainder of the study focuses on how to integrate the findings of organizational theory into flattening the army force structure.

To facilitate this integration process, the monograph introduces then-Colonel Creighton W. Abrams' Elements of Mobility. Abrams' War College study identified five Elements of Mobility – equipment, organization, communications, command structure, and logistical organization – that provide relevant competencies for translating the findings of organizational theory into a flattened army organization exploiting current and future technology. Through this translation process, the monograph identifies several considerations critical to any army reorganization effort.

While evaluating or creating a new force structure remains beyond the scope of this study, the monograph's conclusions provide criteria for any reorganization effort. Any redesign requires an examination of both internal and external variables from the relationship among the garrison, institutional, and operational armies to the relationship among army, navy, marine, and air force capabilities. Any organizational restructuring dependant upon networked communications creating common situational awareness requires an examination of informational echelonment – the ability of the network to filter the database according to the needs of each user. Finally, any organizational restructuring must address how this flattened organization executes operations of both military force and military effort application.

TABLE OF CONTENTS

Section I

Introduction

Technological innovations dramatically alter how military forces apply force or firepower. During the 1990's the U.S. military experienced a dramatic downsizing while simultaneously attempting to exploit advances in technology. This downsizing resulted in increased firepower based on the McNair model of force organization. Given the increased deployments of the U. S. military since the Gulf War, has the U. S. military taken adequate measures to ensure military forces meet the needs of the theater commander? Or should advances in technology and in organizational theory change the current military echelonment by flattening the current military force structure to ensure the efficient application of military force and/or effort?

This SAMS monograph analyzes how organizational structure and technological innovations improve the effectiveness of military forces. By investigating how military organizations can flatten the military force structure, the study reveals how to improve strategic mobility and increase effectiveness by capitalizing on current and future technological innovations. Designing a future force structure remains beyond the scope of this monograph; however, the study outlines the characteristics of that force structure providing a framework for its future development.

As U. S. peacetime engagement moves from diplomacy backed by threat, to diplomacy backed by force, to force backed by diplomacy, military force must

capitalize on both technological and organizational efficiencies to achieve the required results. The characteristics of the military force executing diplomacy by other means evolved throughout history. Section II, Historical Revolutions, examines the dynamic between the nature of the political organization and the nature of the military force that defends it. By exploring the link between the economic/technical nature of society at large and how that economic/technical nature influences military affairs, the monograph establishes the framework for examining Post-Industrial society and the characteristic of the Post-Industrial military force.[1]

With this link between the economic/technical nature of society and the military established Section III, Organizational Theory and the Modern Organization, builds on this framework by introducing a field of study which examines how the characteristics of an organization influence that organization's effectiveness and efficiency. After briefly addressing the field of organizational theory, the monograph re-examines the Industrial society from an organizational perspective. The Newtonian nature of Industrial society impacts the organizational structure and functioning of Industrial corporations – including the military. In contrast to the Newtonian Industrial society, the study next examines the Quantum nature of the Post-Industrial society. Through this examination, the monograph starts to identify the characteristics of the Post-Industrial society that must inevitably influence the military organization required to defend it.

Through Sections II and III, the monograph establishes the link between the economic/technical nature of society and the corresponding characteristics of

that society's military forces. With the aid of organizational theory, the study further characterizes the nature of both Industrial and Post-Industrial societies while identifying the distinguishing features of each society. In Section IV, Organizational Theory and the Modern Military, the monograph examines the Quantum nature of the Post-Industrial society through the lens of the military organization. The examination includes how Quantum Theory influences military organizations, military effectiveness and the peacetime exploitation of military effort. This examination reveals a Quantum perspective on how to view the organization of military force.

Unlike the Newtonian Industrial military designed for the application of military force, the Quantum Post-Industrial military must understand how to apply both force and effort. Exploitation of technological innovation designed to flatten the military organization must consider the application of military force and the application of military effort (See Appendix 1 for a discussion of force versus effort). Viewing military organizations as wave packets provides the necessary perspective for outlining the required characteristics for a Post-Industrial military force.

The Quantum nature of the Post-Industrial military also suggests the need for core competencies. Section V, The Elements of Mobility, expounds on the Post-Industrial organization's need for core competencies. General Creighton W. Abrams identified five elements of mobility (equipment, organization, communications, command structure, and logistical organization) necessary for projecting power. These elements remain relevant as core competencies for

guiding the development of the Post-Industrial military organizations. As core competencies, they suggest how technological innovations flatten the military force structure in the Post-Industrial age.

Expounding on the quantum nature of the Post-Industrial military organization Section VI, Conclusions, summarizes the findings of the analysis and points out the relevant conclusions. The economic/technical link between society and military organizations suggests the Post-Industrial military must understand the organizing principles of chaos and exploit this understanding in the application of military effort. This understanding also must permeate how the military exploits technology while flattening the military organization.

Section II

Historical Revolutions

Military organizations and their employment evolve. The pattern of this military evolution intertwines with the social and technological evolutions and revolutions throughout history. Dr James J. Schneider, Professor of Military Theory at the School for Advanced Military Studies provides one framework for examining this interactive phenomenon. He identifies two primary factors influencing the development and employment of military organizations – the balance that a nation maintains between liberty/growth and security/stability and the interdependent nature of the political/military and technological/economic forces within that nation.[2] These two factors help trace the historical

4

development of both western civilization and the military organizations that provide their defense.[3]

In establishing and governing nations, the people/leaders of that nation consciously or unconsciously determine the balance they maintain between liberty and security. The characteristics of that nation's ideas, norms, and material culture influence this decision. Figure one illustrates this relationship[4]. The dynamics between liberty and stability impact upon every aspect of society.

Constitutional

Parliamentarian   Authoritarian

Liberty	Security
Laissez Faire	Intervention
Autonomy	Tradition
Diversity	Usage
Venture	Custom
Innovation	Uniformity
Freedom of Movement	Risk Averse
Freedom of Contract	Routine
	Introspection

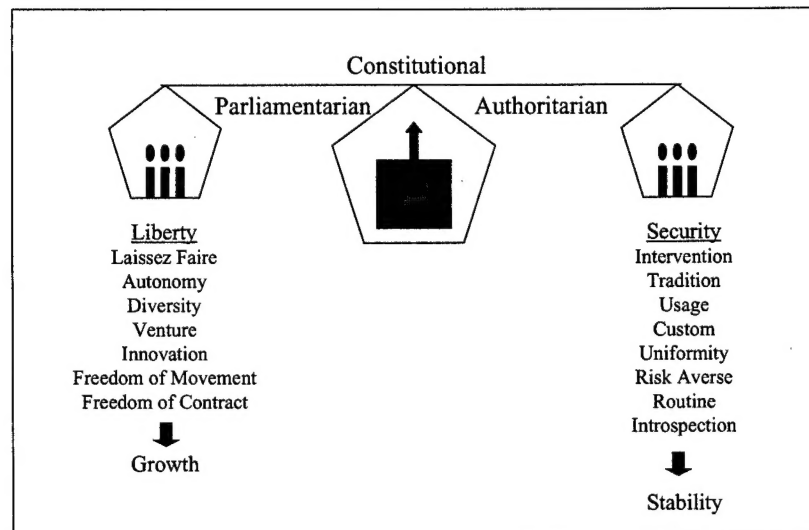Growth   Stability

Figure One

The most dramatic impacts exist in the economic and military spheres. In favoring liberty, a nation unleashes freedom that fosters growth. In favoring security, a nation constrains freedom to foster stability.[5] The political/military relationship that develops from this choice of liberty or stability resonates throughout the society.

Western civilization's penchant for liberty dictates the preeminence of economic over military concerns. Conversely, many non-western civilizations' desire for stability places military needs over economic affairs. The economic growth fostered by the liberty of western society increases the need for capable military forces. This same growth creates the means by which western governments produce the required military forces and influences the character and organization of those forces.

Throughout the evolution of western civilization, the impact of the interaction of economic and military affairs upon military organizations can be seen. To facilitate an examination of this interaction, the monograph utilizes the categorizations of western civilization provided by Dr. Schneider. He categorizes three periods of human development, Pre-Industrial, Industrial, and Post-Industrial societies.

For fifty-five centuries during the period labeled Pre-Industrial, the agricultural revolution influenced all aspects of civilization. This period of history began with the domestication of animals, introduced the cultivation of crops, and saw the development of the city-state. The manual technology of the period contributed to the subsistence economies thriving on extractive industries. Predominantly slave-based, these economies survived through mining, fishing, and farming.[6]

The nature of Pre-Industrial society influenced military activity twofold – in size and application. The overarching societal focus on subsistence coupled with the social stratification of society limited the size of military forces. From the

Greek city-state to the introduction of the modern nation-state, a man's place in society determined his potential militarily and economically.

Both the Greeks and the Romans linked social status to military status. Based on the number of bushels a man's farm produced, the Greek or Roman citizen achieved positions within the military. Relying on the citizen's self interest in preserving their own societal position, this manning system automatically limited the size of the military forces to the number of citizens both physically capable and economically self-sufficient to endure a military campaign. Even after Marius restructured the Roman Legion, the economic nature of Pre-Industrial society limited the size of the army.

Marius recognized the economic strain placed upon the agrarian Roman society by limiting the composition of the legions to only propertied citizens. He "opened the ranks of the Roman army to all citizens irrespective of their property qualifications."[7] This revolutionary change altered the state's role with regard to military forces. Marius' changes required the state to train and equip military forces in addition to organizing them. While the financial burden shifted from the individual to the Roman State, the agrarian nature of Roman society retained its influence on military campaigns.

Without the ability to overcome subsistence living, Roman society could not field an army that could sustain itself during campaigning. The Roman army on campaign either carried sufficient stock to feed itself or foraged the countryside to gather sufficient stock. Although Marius limited the number of slaves or servants authorized to accompany a man on campaign to one, the

logistical burden, coupled with the difficult terrain and animal drawn supply trains, proved too difficult a challenge for Roman society to overcome.[8]

The dual impact of manning and logistics on military campaigns did not end with the fall of Rome. Medieval European militaries also felt their influence. The feudal system that governed Europe during the Middle Ages attempted to solve these same problems. While the introduction of the stirrup to European society and its military altered the nature of both institutions, the problem of logistically sustaining large forces remained.

The feudal system developed as a means to produce sufficient quantities of able horsemen to conduct mounted warfare.[9] While the introduction of the stirrup increased the lethality of the mounted warrior, the skill and resources needed to produce an able cavalryman placed new burdens on society. Only propertied men of means held sufficient resources to create mounted armies. Through the judicious granting of land sects to able subordinates, kings developed the economic base to create and sustain an army of mounted warriors.[10]

Paralleling this military evolution from the introduction of the stirrup, medieval society also began to transform as a result of this and another invention. With the stirrup and the horse harness, the medieval peasants who worked for the king's landed gentry began to create a sustained surplus of food. The efficiencies gleaned from the domesticated horse revolutionized farming. For the first time in man's history, farmers grew substantially more crops than required to sustain themselves. The remarkable impact of technology still did not

alleviate the logistical burden placed on a campaigning army. However with this shift away from subsistence living, medieval farmers set the stage for the creation of a new class in society.

The introduction of the middle class into society created another manpower pool for the military. When the French instituted the *levee en masse*, the Pre-Industrial military reached the apex of its growth. The armies of Napoleon, and soon the armies that fought Napoleon, reached into the hundreds of thousands. Through technological innovation society developed the capacity to man an army with hundreds of thousands of men without suffering economically. As the size of the army grew beyond the capability of one man to orchestrate its action, staff structures emerged to assist in the planning and directing of military activities.

As armies grew in size and staffs developed to orchestrate their activities, new supply techniques developed to sustain these huge organizations. Armies began both stockpiling supplies in depots and outposts and foraging while on campaign. However, the logistical requirements of sustaining such large fighting forces could not overcome the limitations created by animal drawn supply trains. Not until the Industrial Revolution would society and its military develop the capacity to solve this logistical dilemma.

The second Pre-Industrial society influence on military activity stems from the first. Military commanders employed the classical strategy, or strategy of the single point, due to the size and capabilities of their organizations. From the Greeks to Napoleon, the size, equipment and logistical capabilities of armies

influenced the manner in which commanders could conduct campaigns and battles.

For the majority of the Pre-Industrial age, militaries relied solely on man and animal power. The lethality of an organization resided in the skill and muscle strength of the men fighting. The depth of the battlefield remained tied to the strength of the man holding his shield, thrusting his pike, throwing his spear, or drawing his bow. The resiliency of this organization remained tied to the strength of the animal pulling the supply trains. The speed with which this organization could move remained tied to the slowest mammal.

With the introduction of gunpowder, the depth increased to the effective firing range of both cannon artillery and smoothbore rifle. But the pace at which armies could move remained tied to their ability to sustain themselves and their ability to move themselves by foot or animal. These two constraints – man and animal – influenced how militaries fought and thought.

For the majority of the Pre-Industrial age, the constraints imposed upon battles by man and animal required that armies physically collide. These collisions resulted in the decisive battles that shaped this period of history. Commanders trained and equipped their men and then maneuvered and formed their armies to engage successfully the enemy at the point of collision. Since no technology existed that could extend the commanders influence beyond his visual range, armies formed and fought at single points.

With the introduction of mass armies under Napoleon, the army's ability to fight at a single point reached its zenith. The technological limitations of the

cannon and smoothbore rifle still required the commander to form his army at a single point. Napoleon stretched the technological capabilities of his army by arriving at this single point from multiple directions. Through his use of the staff system, the directed telescope, and the development of the corps system, Napoleon maximized the potentialities of man and animal.

The campaigns of Napoleon illustrate the high water mark of Pre-Industrial militaries. Able to harness the manpower unleashed by the domestication of the horse, Napoleon still could not overcome the limitations created by animal powered logistics. The requirement for commanders to observe physically the battlefield also restricted the employment of military forces. With the coming Industrial age, societal and technological changes would enable the military to break the restraints of animal powered logistics and to capitalize on the growing lethality of the battlefield.

With the dawning of the Industrial age, both society and the military underwent profound changes. Breaking the chains of animal driven power and mobility, society entered a new age of prosperity. Unlike eras of cultural and financial success in the past, the wealth and abundance created did not remain in the hands of a few propertied individuals but spread with the development of the middle class. The technology of the Industrial Revolution, coupled with the development of the middle class, dramatically altered the application of military force on the battlefield.

The military implications of the Industrial Revolution evolved from the economic and societal restructuring spurred by the Industrial age. Going from

11

subsistence economies to economic surpluses, the Industrial Revolution altered all aspects of society. The harnessing of steam and electricity, in conjunction with an improved understanding of chemistry unleashed the potentialities resident in both man and nature.[11]

Unencumbered by the shackles of subsistence living, man rediscovered his ability for rationalization and examined all aspects of the world around him. Through this examination western society discovered the utility in dividing labor, creating things in a reproducible manner, and the value in economies of scale.

With the rationalization of means - ends and work - labor, western society expanded the importance and size of the fledgling middle class. With an expanding middle class, the economy grew from solely extractive to extractive, manufacturing and services sectors. The abundance produced in population, goods and services required another societal shift.

As populations grew and the manufacturing and service industries developed, the city-state grew increasingly incapable of governing society. The Industrial age also brought with it the governmental organization of the nation-state. Larger, more robust, and more expansive than the city-state, the nation-state harnessed the capabilities resident within Industrial society and organized both society and her military.

Capitalizing on the abundance of both man and material, the nation-state developed radically different military organizations as she exploited the technological developments of the age. The population increase, in conjunction

12

with the technological developments foster by the new rationalization, combined to create military organizations of size and lethality never before seen.

The impact of logistics upon pre-industrial society precluded the military from sustaining large formations in the field. The weapons capabilities of these same organizations required a physical collision of the opposing armies. The industrial revolution shattered these two physical constraints. With the introduction of the railroad and the telegraph, nation-states deployed and sustained multiple large military formations in the field. The development of motorized and mechanized transportation further increased the reach and robustness of these formations.

Coupled with the increased logistical capability, Industrial era military forces employed weapons of increased lethality and range. While soldier employed firearms increased in range, the advent of communications systems unleashed the potential of artillery thereby extending the depth of the battlefield. The requirement for armies to physically collide to employ combat power began to diminish.

The increased lethality and depth spurred by the initial technological developments generated further technological solutions. As the machine-gun and indirect artillery emptied the battlefield, Industrial society sought mechanical solutions to overcome the increased lethality and depth of the modern battlefield. Mechanization and air-transportation provided solutions to the battlefield conundrum. Their introduction, however, again increased the complexity, lethality and depth of the Industrial battlefield. For nation-states to employ

effectively their military forces, military organizations required a new paradigm for employing combat power.

The Industrial Revolution required military organizations to abandon the strategy of the single point. The fruits of industrial labor created military organizations so large and robust they could not be employed upon a single battlefield. A brief examination of the interaction between the changes in society and the military illustrates the need for a new Industrial age military strategy for the employment of combat power – operational art.[12]

With the ultimate defeat of Napoleon, the pre-industrial strategy of the single point reached its zenith. While Napoleon stretched the capabilities of pre-industrial society, Grant and Sherman demonstrated the potential of the Industrial era strategy of operational art. The size and employment of military forces during the American Civil War illustrates the initial shift in military strategy and foreshadows the era of total war.

While General Robert E. Lee attempted to defeat the Army of the Potomac in a napoleonic battle of the single point, Generals Grant and Sherman demonstrated an intuitive understanding of the shift in military affairs.[13] Both men realized single battles would never achieve the Union war aims. From Vicksburg to Appomattox, both men understood the utility in orchestrating the activities of the several Union armies.

The influence of railroads and the telegraph on military affairs meant local defeats could be precluded or overcome with the quick dispatch of re-enforcing troops. The availability of manpower provided by the fruits of industry further re-

enforced the impotence of the decisive single battle. Unless commanders directed military action towards the defeat or destruction of the systems sustaining fielded military forces, local tactical victory failed to achieve strategic results.

Following the victory at Vicksburg and Grant's subsequent promotion, the activities of the Union Army took upon them a decidedly new flavor. With the west opened, Grant orchestrated the operations of the eastern Union armies with Sherman's operations into the Deep South. By attacking both fielded forces and the means to sustain them the Union leaders linked local tactical successes into ultimate victory.[14] With the foundations of the Industrial-era strategy laid, future military forces exploited new technologies in pursuit of linking tactical success to strategic victory.

The stalemate on the western front of World War I re-invigorated the drive within western militaries to seek technological solutions. The plethora of technological marvels designed and developed in the inter-war years resulted in the high watermark of Industrial era military strategy during World War II. All of the factors that distinguish the pre-industrial and industrial militaries reached their zenith.

World War II pitted several industrialized nations and their armies against each other. Those nations and their armies failing to demonstrate an understanding of industrialized warfare quickly succumb to the more potent and robust armies. The ultimate victors of World War II proved their nations and

armies could fully exploit the output of their industrialized nations while denying their enemies this same ability.

World War II required the employment of operational art on an unprecedented scale. While theater commanders linked battles and engagements to achieve theater objectives, national political and military leaders orchestrated both strategic air power and theater objectives to achieve strategic objectives. The resources employed would baffle both Napoleon and Grant.

The economic wealth and surplus generated by the Industrial Revolution created military forces so robust and so powerful their destruction would require more than one "march to the sea". While the lethality of modern weapons made attrition warfare highly efficient, for battles to be effective, their purpose must be linked sequentially into a logical campaign design. In the 1970's and 1980's, as the lethality of the battlefield continued to increase, western militaries codified how they would employ future military force.

After a systemic examination of the employment of force on the modern battlefield, the U. S. Army developed the Airland Battle doctrine designed to orchestrate the application of force for the entire army. Analyzing the experience of modern militaries from World War II through the 1973 Arab-Israeli War, this doctrine requires a strategic environment conducive to the application of military force. In section IV the monograph examines both the structure of current military forces and the environment in which they operate.

Section III

Organizational Theory and the Modern Organization

Organizational theory integrates the organizational behavior/development and the management/leadership fields of study.[15] This integration recognizes the interdependent nature of how an organization structures itself and the impact of this structure on the human dimensions of effectiveness and efficiency. Through this integration, students of organizational theory learn how to examine current organizational structures to prepare improvement plans designed to increase organizational performance. Systemic in nature, these plans generally call for a shift from an industrial to a post-industrial structural and personnel paradigm.

This call for a paradigm shift results from the synthesis of conclusions drawn from both the organizational and leadership fields of study. Both fields of study developed during the industrial era and produced similar insights. Through their examination of organizations and personnel, coupled with the growing understanding of the new science, both fields rejected the Newtonian industrial era model of structure and management. A brief synopsis of the major conclusions of both fields of study demonstrates the need for this paradigmatic shift.

Prior to the Industrial Revolution little formal management or organizational theorizing occurred.[16] Emerging in the early twentieth century, a structural perspective developed in which organizational theorists examined the structuring and design of work and organizations. Management grew into a field

of study after the theorizing of Frederick W. Taylor. A foreman at Bethleham Steel Works, Taylor's observations developed into the scientific management theory. Paralleling this development, a French manager named Henri Fayol outlined a management theory that typified the classical school. A third school of thought developed based on the writings of Max Weber, a German sociologist who studied the prototypical European organization – the bureaucracy.[17]

The three structural perspectives produced remarkably similar conclusions although developed in different countries through the examination of different organizations.[18] Organizational theorists synthesized these perspectives and identified four features of industrial era organizations: specialization; unity of command; scalar chain (line of authority); and coordination of activities. *Specialization* requires logical groupings of workers according to place of work, product, or functional area. *Unity of command* dictates each worker has one direct supervisor. The *scalar chain* defines a formal organizational structure resulting in reporting relationships from the least skilled to the chief executive. Managers must *coordinate activities* through the use of staff and planning mechanisms that ensure communication among specialized groups.[19]

The structural perspectives dominated organizational thinking from the early twentieth century until the 1930s. With the advent of World War II organizational theorists developed behavioral perspectives. Rather than examining how the structure of an organization impacted its performance, the behaviorists studied the interaction of the members of the organization. From

1940 to 1960, behaviorist organizational thought shifted from group dynamics, to the leadership school, to decision-making theory.[20]

From the 1960s until today, an integrative approach developed among organizational theorists. Linking both the structural and behavioral perspectives, the integrative approach also examined the impact of specific environmental and other external influences. The Sociotechnical school "concluded that technological changes must be made in conjunction with a strong social system: that both social and technical/structural aspects of jobs must be considered simultaneously."[21]

A second integrative approach, Systems theory concluded that organizations resemble physical systems such as the human body or a microscopic organism. These open systems interact with environmental factors. They further concluded that systems: "comprise a number of interrelated, interdependent, and interacting subsystems; …the organization is open and dynamic; …it strives for equilibrium; and …it has multiple purposes, objectives and functions, some of which are in conflict."[22] Figure two illustrates the systems model.

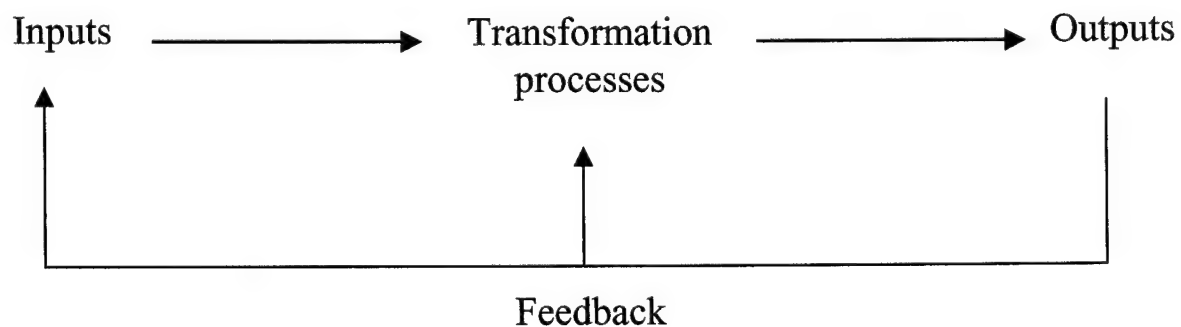Inputs ———————▶ Transformation processes ———————▶ Outputs

Feedback

| Figure Two |

An open and dynamic system continually receives new energy or *inputs,* i.e. people, materials, money, goals, or information concerning strategy, the environment and history. The organization then transforms these inputs into new *outputs.* This *transformation process* results from the dynamic relationship existent within the organization – task characteristics, individual characteristics, formal organizational processes, and informal organization. Task characteristics include specialization, feedback, and autonomy. Individual characteristics include needs, knowledge, expectations, and experiences of organizational members. Formal processes include structure, job design, reward systems, and performance evaluation systems. Informal elements include leader behavior, group and inter-group relations, and power behavior outside the formal hierarchy. The organization accepts the new inputs and through the transformation process creates new outputs such as performance, satisfaction, and morale.

The new input and/or transformation process generates a second order effect within the organization. As the organization deals with the new input, it simultaneously seeks stability or equilibrium. The organization uses the *feedback* created by the new output to modify the inputs or transformation processes to create a more desirable outcome and thus return the organization to equilibrium. The feedback also serves a second purpose by identifying which subsystems have similar or conflicting goals.

As an open system, organizations also possess *equifinality* – the ability to employ a variety of means to achieve the desired objective. Understanding that no single structure or transformational process can adapt to all situations,

systems theory asserts that organizations must be *adaptive.* To avoid decay and their ultimate demise the organization must adapt the *system* appropriately. When unable to adapt or change, entropy causes the organizational system to fail.[23]

The last integrative approach to organizational theory resembles systems theory. Contingency theory "provides a more comprehensive view that calls for a *fit* between organizational processes and characteristics of the situation."[24] Examining the fit between an organization's structure and its environment, early contingency theorists developed two systems: mechanistic (machinelike) for stable environments, and organic (living, human, and flexible) for changing environments. Other theorists suggested the organizational system developed should depend on the organization's technology – unit, mass production or continuous process. For these theorists a mechanistic organization fits best with mass technology, while an organic organization fits best with either unit or continuous process.[25]

This brief history of organizational theory highlighted the three major perspectives – structural, behavioral, and integrative. Through the synthesis of the first two perspectives into the third, organizational theorists developed views that looked beyond the organization itself. Avoiding the closed view of the structural and behavioral theorists, the integrative theorists exposed the impact of external influences on organizational behavior and effectiveness. This open system perspective challenged the simple cause and effect outlook prevalent in

the other two perspectives. Similar challenges developed in the management/leadership field of study.

Unlike the short history of organizational theory, management/leadership theory extends into the beginnings of recorded history. From the *I Ching*, to the *Iliad*, to the *Bible*, to Machiavelli's *The Prince*, man examined the relationship between the leader and the follower. Bernard M. Bass, Distinguished Professor of Management at the State University of New York, Binghamton, and his writing partner, Ralph M. Stogdill, Professor Emeritus of Management Sciences at Ohio State University, created in their *Handbook of Leadership* the most complete anthology of concepts available under one cover according to the editors of the US Army War College's *Parameters*. According to Bass and Stogdill:

> The long history of reliance on great-man theories naturally led to the search for traits of leadership and the theories of traits. In reaction, there arose an equally strong emphasis on environmental theories. Finally, syntheses were achieved in theories of interacting persons and situations, built around psychoanalysis, role attainment, reinforced change, paths to goals, or contingencies of leader and situation.[26]

In the *Handbook of Leadership* the authors present an extensive compilation and examination of management/leadership theories and models from the great-man theories to contingency theories.

In contrast to Bass and Stogdill, Professor Joseph C. Rost of the School of Education at the University of San Diego examined the models and theories of management/leadership since the 1930s collectively and concluded that they represent an industrial paradigm of impersonal and bureaucratic management. Each theory possessed the following characteristics: structural-functionalist;

management-oriented; personalistic in focusing only on the leader; goal-achievement-dominated; self-interested and individualistic in outlook; male-oriented; utilitarian and materialistic in ethical perspective; and rationalistic, technocratic, linear, quantitative, and scientific in language and methodology.[27]

The essence of these eight characteristics resides in the industrial paradigm model of leadership as good management. "Good management is the apex of industrial organizations, the epitome of an industrial society, the consummate embodiment of an industrial culture."[28] Rost outlined four essential elements which define management: management is an authority relationship; the people in this relationship include at least one manager and one subordinate; manager(s) and subordinate(s) coordinate their activities; and manager(s) and subordinate(s) produce and sell particular goods and/or services.[29]

Rost believes that just as management defined the industrial paradigm, leadership defines the post-industrial paradigm. He outlined four essential elements of leadership: the relationship is based on influence; leaders and followers are the people in this relationship; leaders and followers intent real change; and leaders and followers develop mutual purposes.[30] The most striking difference articulated by Rost between management and leadership resides in the relationship between leader and follower. In the industrial paradigm, subordinates could not do management (since they were not managers); they had to do followership. In the post-industrial paradigm, followers and leaders do leadership. The passive, subordinate nature of the industrial follower evolves into an active, reflective, and involved post-industrial follower.

23

The altered dynamic between leader and follower in the post-industrial paradigm parallels the shift introduced by the integrative organizational theorists. The open system that challenged the industrial cause and effect mentality requires a different form of leadership than the industrial paradigm of good management. The synthesis of these two schools of thought produced a new organizational outlook. Shifting from the hierarchical, linear, pragmatic, Newtonian industrial model, organizational theorists today look to develop a flatter, non-linear, Quantum post-industrial model.

During the 1980s and 1990s organizational theorists synthesized the findings of the organizational and leadership fields by examining the structure and functioning of the modern corporate organization through the lens of Quantum and Chaos Theories. Many of these theorists concluded that current organizational design and operations run according to a Newtonian world-view. This outlook influences all aspects of the organization and its effectiveness. With the changing nature of the economic environment, most of the organizational theorists predict the modern corporation must also evolve into a more adaptive and responsive organization. The evolution from Newtonian to Quantum organizations will dramatically alter the corporate structure and *modus operandi*.

Dr. Kathleen E. Allen, Dean for student development at Mount St. Mary's College, characterized this evolution from a Newtonian to Quantum organization as a shift from linear to non-linear thinking. In the Newtonian world-view, "we like to think people and organizations can be taken apart and put back together to be

understood or repaired."[31] This Newtonian mechanical determinism fails to guide

organizations operating within a complex, dynamic environment.

The old paradigm created from Newtonian determinism worked in an

external environment that is predictable and stable.[32]

```
┌─────────────────────────────┐
│ L in e a r  N e w t o n ia n   T h in k in g │
└─────────────────────────────┘

 P r o b le m s  a re  s e p a ra te
 E v e ry  p ro b le m  h a s  a  s o lu tio n
 D e c is io n s  a re  s e p a ra te  e v e n ts
 Y o u  c a n  g e t a h e a d  o f th is  g a m e
 E v e n ts  a re  s e p a ra te
 P la n n in g  fo r c o n tro l
 P ro d u c t fo c u s  -- h o w  to
```

Organizations operated under the assumption that a linear line existed between

cause and effect. This determinism required that problems be viewed as

separate and distinct entities. Through thorough reductionism organizations

solved problems by dividing and sub-dividing portions of a problem. This

reductionism led to specialization within organizations designed to examine

specific areas of a problem.

Quantum organizations break this linear reductionism by recognizing the

chaotic nature of dynamic systems. A non-linear systems approach replaces the

Newtonian cause and effect mentality. Quantum organizations understand

things don't progress in an orderly, predictable way. These organizations also

understand that the random appearance of events in a dynamic system belies an

underlying order and rhythm. Furthermore, this underlying order exhibits a

sensitive dependence on initial conditions and can change rapidly.

Non-linear Quantum Thinking	
Problems are connected-Solving one problem will frequently trigger new problems that are related to the old one	There is no ahead or behind, only "being in" the game
Problems do not always have a solution and often return in a different form to be solved again	Life is made up of streams of events; events are connected
Decisions are not single events but become a stream of decisions as they respond to constantly changing conditions	Planning is done to help an organization improvise, to respond to the unpredictable
	Process focus -- ways to

The challenge facing modern organizations according to these organizational theorists is how to create organizations capable of operating intelligently from organizations based on the mechanistic Newtonian model. Based on modern man's growing understanding of quantum and chaos theories, organizational theorists predict human organizations must incorporate this understanding into the design and function of complex modern organizations. How the army should do this constitutes the remainder of this monograph.

Section IV

Organizational Theory and the Modern Military

The integration of the findings of organizational theorists into the modern military force structure requires analysis in two fundamental areas: the nature of the current military organization and the nature of the current operating environment. This analysis demonstrates the Newtonian characteristics of how current military organizations apply force to achieve military objectives, while

26

operating in a strategic environment which requires an understanding of both the application of force and the application of effort to achieve military objectives.

The essence of Newtonian physics is predictability through the application of mechanical force.[33] In principle, no matter how complicated or complex a task, if one knows enough information surrounding an event, one can predict exactly how that event will unfold. Newton derived his laws of motion from simple experimentation. "The lesson of Newtonian physics is that the universe is governed by laws that are susceptible to rational understanding."[34]

For the Industrial era military Newtonian physics manifests itself in two overriding aspects of operations and organization. Predictability infuses the staff estimate and the Military Decision-Making Process (MDMP) through the application of military force. Reductionism creates parts and organizes them into functions. The two Newtonian influences result in armies that attempt to dissect a problem into its component parts, synthesize a solution, then tailor an organization to implement a solution.

Newtonian armies begin the dissection process by categorizing activities as diplomatic, informational, military or economic (DIME). The DIME framework establishes separate functions with separate responsibilities which military staffs attempt to integrate. Because the integration of the DIME usually takes place at or above the operational level of war, the tactical application of force remains devoid of direct political, economic, and / or informational objectives.

During the staff estimate and mission analysis, the military planner examines the two competing military systems. This examination extends the

27

dissection process into the heart of the military problem. Following the adage of Sun Tzu, the military staff attempts to understand fully the strengths and weaknesses of the two opponents. By examining the capabilities and potentialities of each system, while simultaneously applying those capabilities and potentialities upon the air and ground of the future conflict, the staff planner determines the nature of the force needed to protect friendly units while simultaneously attacking enemy units.

The military staff synthesizes the data produced from their reductive staff processes to determine what manner of organization should be employed. Just as the military staffs organize around functional areas, Newtonian armies also organize around functional groupings. The military staff must "package" the appropriate functional organizations together to create military formations capable of conducting the operation.

In contrast to the predictable Newtonian or Industrial military organization, the quantum or Post-Industrial military must deal in probabilities and contingency. "Probabilities are the odds that something is going to happen, or that it is not going to happen."[35] Even with "perfect" information about an event, quantum theory can not predict the outcome. It can only predict the probabilities. This uncertainty resides in the nature of both the world and our relationship with it.

Newtonian physics sought to determine the exact position and momentum of a particle in motion to determine where that particle would be in the future. The Industrial era military staff relies on this same predictability to both deconstruct the problem and to structure the military organization to apply force

28

in resolving the problem. Quantum theory precludes determining the exact position and momentum of the particle in motion. The more precisely we know one measurement, the less precisely we know the other.[36] The Post-Industrial staff cannot rely on predictability but must deal with probabilities.

Organizational theorist Karl Weick believes quantum theory portends new approaches to organizational analysis. "Until we put the environment in place, how can we formulate our thoughts and plans? In strategic planning, we act as though we are responding to a demand from the environment; but, in fact, …we create the environment through our own strong intentions."[37] Unlike predictive Newtonian planning, Quantum planning becomes "just in time". Absent predictability, Newtonian task organizing becomes a mute point. The military organization employed must be capable of responding to a wider range of *probable* enemy actions.

Quantum theory suggests another factor impacting on Post-Industrial military planners. "Scientists have observed a level of connectedness among the seemingly discrete parts that are widely separated in time and space."[38] Described as non-local causation, this influence directly impacts on the military staff's analysis of the problem and the actions they recommend for achieving their objective. Non-local causation re-enforces the multi-facetted nature of Post-Industrial military operations.

Finally, quantum theory suggests "in a constantly evolving, dynamic universe, information is the fundamental ingredient, the key source of structuration – the process of creating structure."[39] While Newtonian physics

29

relied on predictability to determine information, quantum physics relies on probabilities. Industrial armies task organized their structures to tailor the composition of the organization to achieve mission accomplishment through the application of force. Quantum armies must create organizational wave packets to achieve mission accomplishment through either the application of force or effort.

Without predictive foreknowledge, military staffs must develop organizations with "resources to expand in potential until needed."[40] Quantum armies require an organizational structure robust enough to apply appropriate force while simultaneously possessing the capability to apply military effort. Military effort enables these military organizations "resourced to expand in potential" to operate in a post-industrial environment.

The nature of post-industrial society dramatically impacts upon military forces and their operations. The Newtonian industrial era military emphasis on force application must reconcile with the information dominant requirements of the post-industrial era of service or effort application. The information based society created by the post-industrial environment demands an information based military capable of: adapting to increased media coverage; miniaturizing both costs and force structure; and "discard[ing] the notion that policy ends when war begins or that war can have goals distinct from those of national policy."[41]

Increasing media coverage affects all aspects of military operations – from when and how to alert forces, to soldier-reporter relations in the field, to the relationship between military force application and military effort application.

30

With the advent of worldwide 24-hour coverage, post-industrial military actions occur under the continual scrutiny of governmental, non-governmental, and supra-national organizations. The increased media coverage highlights both the surgical precision of post-industrial weapons and the physical destruction these weapons achieve through the application of military force. This coverage also serves to instigate non-violent military interventions, then critique the actions of military organizations as they apply military effort. The ubiquitous nature of media coverage compresses the time for decision-making at all levels and further complicates the relationship between political and military priorities.[42]

The media coverage further accentuates the ever-present tension between military methods and political objectives. "The root issue that must be faced is the proper coordination of military means with political ends. And there seems little doubt the two are, to some extent, incompatible."[43] This incompatibility manifests itself within two spheres – the application of force and the application of effort.

Although hailed as the army's mission – to win the nation's wars – the application of force exists on a continuum operating from diplomacy backed by threat, to diplomacy backed by force, to force backed by diplomacy.[44] As actions move across this spectrum, the relationship between political constraints and military action continually fluctuates. "The careful tailoring and high degree of political constraint which may have been effective in guiding a demonstration of national power without violence [might] restrain the effective application of military power through military violence."[45]

This same tension exists between political objectives and the application of military effort during humanitarian operations. Military security concerns and objectives may conflict with political considerations of host nation or allied sensitivities. Increasingly, military concerns may also conflict with allied or coalition political objectives.

The tension between political objectives and military means extends into the cost and composition of the military force structure. With modern industry streamlining operations and cutting costs by infusing computer technology into every aspect of business, military forces sought these same benefits through similar processes. Military emphasis, however, remains focused on the application of force. Increased lethality gained through precision munitions decreases the force structure required to apply military force.

This same decrease in force structure hinders operations of effort application. As military forces spend funds executing humanitarian missions with increasing political pressure to exert military effort versus force, many of the anticipated cost-benefits remain unsecured. In this context, the miniaturization of the military only serves to increase the demand on the fielded forces. Technological innovations applied to force application rarely correlate into equally improved effort application instruments. Manpower decreases further strain all operations short of the application of force.

An information-based military capable of operating in a media saturated environment, under increased political constraints, with a decreasing force structure, requires a flattened organizational structure based on core

competencies. In the next section, The Elements of Mobility, the monograph examines five competencies necessary for structuring a post-industrial military.

Section V

The Elements of Mobility

In 1953 as a student at the United States Army War College, then-Colonel Creighton W. Abrams examined "the relationship between mobility and firepower as they apply to the employment of armor and the defense against armor on the battlefield."[46] Abrams limited the scope of his effort to an analysis of the mobility of armored versus infantry divisions by omitting a discussion of the strategic mobility of airborne divisions and naval and air forces. However limited his analysis, many of his deductions and conclusions remain relevant as the army examines the impact of integrating new technology into both the army's structural organization and fighting doctrine.

The genesis of Abrams' article grew out of his assessment of the army's emphasis of firepower over mobility. While the "history of armor as the decisive formation on the battlefield was really limited to World War II," the force structure of the US Army in 1953 favored the organizational employment of the tank as an infantry support weapon rather than as the supported weapon in the armored division.[47] The absence of a provision in the army for an armored corps or armored armies reinforced Abrams' conclusion. By emphasizing firepower over mobility, the US Army illogically neglected the benefits technology afforded military organizations.

For Abrams "The application of new developments to old principles is the one area in which the army can strive for initial superiority."[48] His analysis of the army structure in post World War II era utilized the principles of war (the Objective, Simplicity, Unity of Command, the Offensive, Maneuver, Economy of Force, Surprise and Security) as a means for comparing the relative degree in which firepower or mobility dominated the force structure. Abrams believed "the relative position of mobility and firepower must be determined by modern developments in equipment."[49] Through this analysis, Abrams concluded that the US Army principle of maneuver most directly refers to mobility. Quoting Liddell Hart, Abrams stated "lightly armed troops can beat more heavily armed ones if their mobility is sufficiently superior, demonstrating that the 'weight' of a force is its weapon power multiplied by its mobility."[50] Abrams based his belief in mobility on his practical experiences of World War II, 2 ½ years as Director of Tactics at Fort Knox, and over 36 months as commander of both a tank battalion and armored cavalry regiment.

Abrams outlined five essential elements of mobility – equipment, organization, communications, command structure, and logistical organization. The basic requirement of mobility "is the capacity to move combat power on the battlefield."[51] The organization's equipment must balance competing demands among firepower, armor protection, cross-country and road movement. The desire for overwhelming firepower must not create excess weight, require excess fuel, or limit movement itself, but this firepower should be complementary. Vehicular armor protection should provide a minimum of protection for movement

under fire appropriate to the vehicle's usual exposure to fire. All vehicles should possess the same cross-country and road capability; common vehicular development will ensure similar characteristics.

Organizationally, units must contain adequate capabilities to function in combat. "Mobility is dependent upon a composite integrated organization."[52] Infantry must accompany and fight with tanks. Engineers must reduce obstacles by bridging or demolitions. To ensure mobility, units must also contain reconnaissance elements and sufficient administrative and logistical elements to sustain the combat effort.

"Communications contribute to mobility, because they provide the means of controlling the movement and firepower of units."[53] By complimenting the organizational structure, proper communications ensure component parts (tanks, infantry, artillery, engineers, and reconnaissance) promptly and reliably communicate with one another. Abrams quotes General Heinz Guderian who "credits much of the success of the German operations [in France] to superior communications, an item on which the Germans had spent much time and effort."[54] Through superior communications, the German mobility negated the two-to-one superiority in tanks enjoyed by the French at the outbreak of hostilities.

Proper communications compliment command technique. Mobile operations require de-centralized command and control. "In the command of mobile operations, great latitude must be extended to subordinates as that they may freely exploit the mobility at their disposal."[55] Recognizing that the

command structure must be as mobile as the rest of the organization, commanders organize their headquarters to operate promptly and timely to the rhythm of the battle. If headquarters require hours to issue appropriate orders, the mobility inherent in the organization will be compromised.

The fifth element of mobility - logistical organization - requires delicate balancing. While Abrams clearly understood the need for the logistical organization to keep man and machine operating, he also recognized the competing demands placed on these units. The logistical tail must be sufficiently robust to sustain the organization while simultaneously lean enough to prevent the weight of the "tail" from restricting mobility. As power projection replaces forward deployment, the impact of this logistical balancing act increases exponentially.

Abrams outlined his five elements of mobility to illustrate the integration required in an organization to rapidly concentrate combat power. He questioned the army's trend toward firepower over mobility when we had not yet arrived "at the era where firepower would be decisive."[56] With the changing nature of the strategic environment, "decisive" application of force remains a silver bullet.

Section VI
Conclusions

Military organizations and their employment evolve while both protecting and reflecting the economic and political order that created them. From Ancient

Greece to Modern America, the ever changing nature of combat and the strategic environment illustrates this process. With the dawning of the post-industrial era, society and the military organizations that protect her again prepare to undergo an evolution in their make-up and employment. The information revolution portends significant alterations in how military organizations are structured and employed.

Organizational theory provides a focused lens through which one can examine any potential organizational transformations. The most significant and insightful finding emerging from this field involves complexity theory. The chaotic nature of dynamic systems precludes simple linear cause and effect interpretations. This finding impacts how the army must examine itself and the environment in which it operates. Linking this finding with the elements of mobility provides a comprehensive framework for analyzing how to flatten the army structure of the post-industrial era.

Organization

To effectively restructure how the army organizes to operate in the post-industrial environment, complexity theory requires the redesign to examine both internal and external variables. Internally the redesign incorporates aspects of the structural, garrison, and operational armies. Redesign conceived and implemented incrementally from the brigade level up risks overlooking efficiencies possible with a more comprehensive restructuring.

Within the operational army, the redesign must examine the organizational functions resident within the different echelons of command. Any flattening of

these echelons must comprehensively examine the tactical and operational functions executed by army units. The operational restructuring must also address the duel nature of army employment – force and effort application. The restructured army must possess the potential to effortlessly move across the spectrum of political/military interaction.

In executing operations across the political/military spectrum, the new organizational design must address the current Newtonian staff structure. Organizational theorists describe new corporate structures based on 'self-directed' work teams. While functional or task proficiencies remain resident within the work team, the work team concept eliminates the *specialization* and *unity of command* structure resident in Newtonian organizations. Functioning more like beehives, the members of the self-directed work team continually move from leader to follower to leader based on the circumstances of the situation.

Militarily, this staff re-organization involves the elimination of the J/G system of specialization and the creation of staff organizations based on time/space orientations. While today the army creates ad hoc battle staffs and deep operations cells, the 'self-directed' army staff organization revolves around permanent groupings of present, near-future, and future staff cells.

Structurally, the army redesign must anticipate and incorporate systemic changes. Any significant restructuring of army tactical organizations portend changes to schooling, training, and assignment requirements. To maximize the effects of any restructuring, army garrison functions require examination. As garrisons become "power-projection" platforms, these installations create

opportunities to ease the Title X requirements of fielded forces. The flattening of army forces must include a redesigned garrison organization capable of executing sustainment functions thereby reducing the logistical burden of the fielded force.

Externally any redesign must be cognizant of and complementary to air force, navy, and marine structures. Beyond simply acquiring platforms capable of being transportable by current air force lift aircraft, all post-industrial army organizations must possess the capability of functionally integrating with sister services. The integration of air and ground power requires the most extensive examination. Post-industrial army units must possess sufficient "situational awareness" to direct the employment and exploit the tremendous firepower inherent in air forces.

The ability to generate overwhelming firepower rapidly and accurately increases in significance as military forces operate within the sliding spectrum of political/military operations. While initial political constraints may limit any application of force during humanitarian type missions, any eruption of violence requiring immediate and effective retribution demand forces trained and structured for effortlessly transitioning from effort application to force application. This force structure requirement dictates true joint integration.

Equipment

Flattening the army structure requires efficiencies achieved through utilizing common platforms and developing enabling technologies. By focusing this effort, the army creates a force whose 'weight' truly derives from its weapon

power multiplied by its mobility. In defining this weight, however, the army must divorce itself from its traditional method of measurement.

Although land power may be decisive according to *FM 100-5 Content Summary* in many instances this decisiveness results from the proper application of both firepower *and* maneuver. Any measure of firepower must include joint systems. Generating and sustaining combat power requires the synchronization and orchestration of all available joint assets. While the army inherently relies on strategic air and sea power for strategic mobility, the army discounts air and sea assets as it calculates the operational and tactical 'weight' of a deployed force.

To correct this oversight, two measures must be undertaken. The army must deliberately tabulate ground 'weight' by including the appropriate air and sea systems that habitually aid in ground maneuver and the army must develop integrating systems which enable the 'ground' element to effectively employ and exploit these air and sea systems.

This recalculation of 'weight' should follow the Marine Expeditionary Force (MEF) model. Through the synergies created the MEF's combat 'weight' totals more than the sum of the Marine Air Wing (MAW), the Ground Combat Element (GCE), and the Ground Support Element (GSE). The nature of their command and control relationship combined with their employment doctrine effectively establishes an integrated organization capable of exploiting both firepower and maneuver.

To further facilitate this process, the army must develop the systems and forge the doctrine to spur similar efficiencies. Embedding conduits with

interconnectivity across both army and joint systems, the effective 'weight' of the ground force rises exponentially. The resulting force generates the integration at the operational level described by Abrams as so essential at the tactical level.

The robustness of this integrated force increases dramatically as more and more combat and support systems rely on common chassises. While the diminished demand for parts creates efficiencies, common chassises allow in theater system regeneration. During intense combat, partially damaged systems cross-leveled allow theater support forces to salvage usable combat power without substantial rebuilding efforts.

By extending Abrams' views on mobility, modern technology enables the creation of mobile forces of tremendous firepower. A fundamental integration of air, sea (where appropriate), and ground power similar to the MEF, allows the ground elements to effectively balance the competing demands among firepower, armor protection, cross-country and road movement. With the application of smart defensive appliques, the vulnerability of ground elements substantially diminishes.

Communications

Critical to any re-design, interconnectivity must be embedded within all future combat systems. More than simply placing command and control apparatus within each vehicle, the interconnectivity necessary to generate superior mobility requires a disciplined operating structure. This discipline enables common situational awareness while preserving the capability to identify,

collect, store, and access the different informational requirements demanded by the different levels and functions of command.

A disciplined command and control network requires deliberate and detailed analysis. In constructing the system, tradeoffs necessitate the creation of a network with acknowledged shortfalls. This knowledge enables these shortcomings to be addressed with other capabilities. However, through the judicious tailoring of the command and control apparatus, critical capabilities can be identified and embedded.

One such capability involves informational echelonment. A system robust enough to create a common situational awareness across air, sea, and ground systems requires a multi-facetted filtration capability. The informational requirements needed at the lowest ground level differ drastically from both higher level ground commands and air and sea elements. By deliberately designing an information network capable of storing and processing multiple inputs from multiple sources this informational repository effectively supports the networked user.

Another critical design consideration involves determining the lowest element capable of instantaneously inputting data. While front line ground elements certainly require access to this common situational database, their capability to *input* data effectively must overcome two inherent limitations – their proximity to the enemy and the training potentiality of their crews.

The time/space relationships between air and ground based systems dictate the relative timeliness of their data input capabilities. While technology

continually increases the range at which targets can be acquired and engaged, the relative difference in time and distance between air systems and their targets and direct-fire ground systems and their targets favors air systems. This slight differential allows the air system to effectively collect and input data into the common database while simultaneously engaging the target. This same differential effectively limits or denies the direct-fire ground element this same capability.

The training potential of the crews compounds this time differential. While officers command and/or control all air-based systems, non-commissioned officers and enlisted soldiers operate the vast majority of direct-fire ground systems. Even if the army could replace all vehicle commander positions with officers, the time/space differential still precludes utilizing direct-fire ground systems from effectively inputting data without creating a brilliant data collection system for every ground vehicle. This training potential necessitates a different data input system.

For ground elements to effectively input data into the system, multiple collection platforms must be created. While operated by and utilized for the information requirements of ground elements, these collection systems must incorporate the capacity to collect usable data for ground, air, and sea systems. By relieving the direct-fire ground systems from the data collection process while providing these same elements the capability to collect on their informational requirements, these ground elements can effectively fight and exploit the current situation while simultaneously providing data for exploitation by other elements.

43

Command Structure

The most complex issues surrounding any effort to flatten the army force structure involve the command and control process and structure. The army and subsequently the armed forces will generate limited efficiencies through re-design unless these efforts adequately address these issues. Predominate among them are decentralization, span of control, and training.

The tension between decentralization and centralization impacts every aspect of the art of command. While this tension certainly existed during the pre-industrial era, the size and complexity of industrial era militaries exponentially compounded the problem. With large formations operating over vast expanses, commanders continually wrestled with providing adequate guidance to commanders frequently out of direct contact. In the U. S. Army, commander's intent evolved to provide subordinates a framework for operating without further guidance should the situation change or communications breakdown.

The technological innovations of the post-industrial age appear to provide the technical means to eliminate the connectivity problem while providing the capability to maintain continual situational awareness of both higher and lower organizations. This capability also foreshadows the opportunity to quickly issue and act upon appropriate orders. This same situational awareness provides commanders the capacity to over-control their subordinates.

General Abrams acknowledged this tension but believed to exploit the mobility of an organization, subordinate commanders require freedom of action. By reducing the command rank of the combat command from brigadier general

to colonel, Abrams felt the army hindered the mobility of the combat command. The creation of an assistant division commander removed the brigadier from the position best able to exploit the mobility of the command. In flattening the army, increasing the command rank structure through the depth of the organization empowers the subordinate unit to exploit both the increased experience level of the commander and subsequently the mobility inherent in the organization.

The increased command rank structure also addresses a major dissimilarity between military and civilian organizations. The drive by organizational theorists to create empowered organizations capable of effectively interacting with their environment presupposes both a free market economy and an organization operating under only self-imposed constraints. As an instrument of national power, subject to both congressional oversight and presidential control, the military lacks these same institutional freedoms. To exploit the findings of organizational theory, the military must develop units capable of creating and effectively exploiting opportunities within the political constraints surrounding the situation.

More experienced commanders bring added maturity to complex problems. This maturity aids the organization in dealing with the problems created and influenced by non-local causation. Each decision in this environment includes tactical, operational, strategic, and political components. Each action in this environment carries tactical, operational, strategic, and political impact.[57] The role of the decision-maker at every level increases in importance. Since political and legal limitations prohibit the creation of military

organizations capable of bottom-up decision-making, placing more experienced commanders further down in the command structure achieves the same result. As the military organization interacts within its operational environment, the increased maturity level of the commander enables the unit to make timely decisions designed to fully exploit both the situation and the unit's potentialities.

The increased rank of commanders also allows the military to prepare those selected for command with additional education. Ideally, a flattened military organization would embed State Department officials within the structure to ensure all actions serve both political and military objectives. Without this radical structural shift, the restructuring remains responsible for resourcing the unit to conduct operations along the entire political/military spectrum. While the extreme left (domestic support) and right (nuclear conflict) ends of the spectrum appear fairly straight forward regarding political/military interaction, the vast majority of operations occur somewhere between these two extremes – limited operations with limited political/military objectives. This additional education focused entirely on the interaction between the international and domestic political process and military action prepares the commander for his most demanding role – balancing military actions and objectives with political considerations.

By flattening the force structure, the army seeks the efficiencies created in commercial industry with the elimination of several layers of middle management. Unlike commercial industry, military structures execute their prime roles by physically moving the force structure. The size and scope of the operation

determines the number of organizations required for accomplishing the mission. This variability complicates the flattening process as the drive for eliminating intermediate headquarters clashes with retaining effective spans of control.

Army organizations, particularly the command and control structures, require the ability to quickly attach and detach subordinate units as the situation demands. A restructured army devoid of any middle management command and control apparatus risks losing the flexibility provided by multiple headquarters. The link among command and control, communications, and the hierarchy of functions requires detailed analysis before the army eliminates intermediate headquarters to flatten the force structure.

Logistical Organization

Logistics remains a preeminent function of army operations above the tactical level. With the tremendous growth of military organizations during the industrial era, logistical organizations - specifically strategic logistical organizations - took on increased importance for nations at war. The size and robustness of deployed military forces generated concepts for strangling the fielded forces while simultaneously destroying the infrastructure creating and sustaining the force. As technology deepened the battlefield, the logic of force application led to total war strategies designed to destroy a nation's capacity to wage war.

As the industrial military enters the post-industrial era, the total war mentality seeking to destroy a nation's war-making capabilities appears incompatible with operations conducted for limited political/military objectives.

This notwithstanding, the operational logistics structure required for power projection operations remains a valid and vulnerable target. A flattened army structure must balance the physical demands of creating in-theater support organizations with the operational demands of the deployed force.

Current army efforts to resolve this dilemma revolve around two approaches – just in time logistics and a tactical re-organization. Mirroring commercial industry, the army logistics community seeks efficiencies generated by an intelligent and predictive demand system coupled with an intelligent tracking system. This dual effort reduces multiple layers of storage facility requirements while simultaneously eliminating the requirement to move these stores during operations. This streamlined approach lightens the burden of operational and tactical logistical formations.

Designed to enhance the streamlined re-supply system, the tactical re-organization removed the logistical elements from the lower tactical units. Contrary to Abrams' mobility requirements, the tactical re-organization favored centralizing logistical operations. A flattened army structure capable of exploiting the mobility generated from the synchronization and orchestration of joint assets requires a composite integrated organization with organic logistical units.

With integrated logistical units, the post-industrial army reduces the risk posed by threatened operational lines of communication. With logistical capability distributed throughout the army structure, the organization as a whole retains resiliency. Units capable of plugging into any number of logistical

pipelines provide tremendous flexibility. Units tied to a single logistical hub based on a lack of organic logistical capability limit mobility.

By returning an organic logistical capability to tactical units, the operational footprint need not grow. Through an examination of the functions required to develop and maintain operational bases, a flattened logistical structure distributes these functions across the garrison, operational, and tactical formations. Requiring the power projection garrisons to assist with Title X logistical burdens also helps shrink the operational level logistical organization.
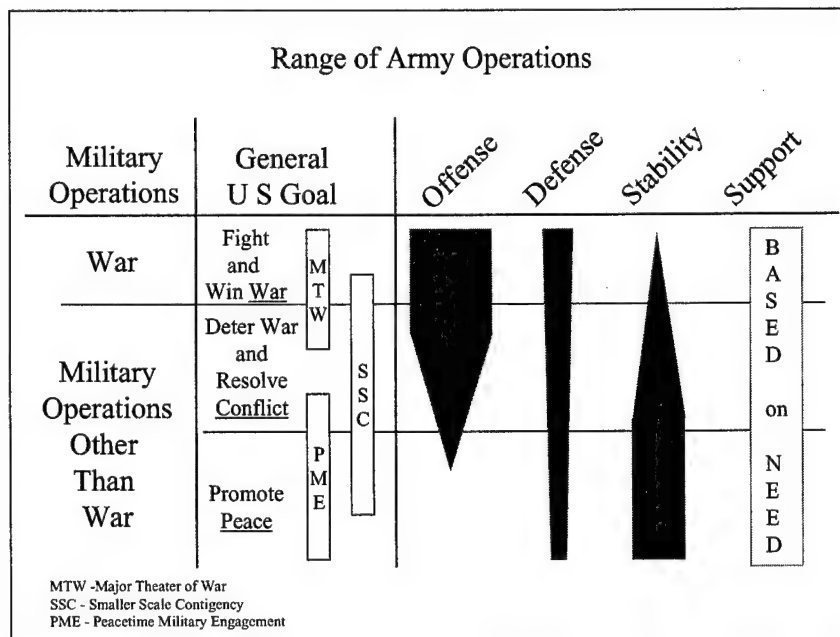
The drive to shrink the operational tail of post-industrial army operations must remain cognizant of the joint nature of army logistics at the operational and strategic levels. While the army remains dependent on both air and sea lift for strategic and operational mobility, air and sea forces remain dependent on army logistical units for several Title X sustainment functions. Any redesign must retain the capability to both sustain army and joint forces.

As the army transitions from an industrial model to a post-industrial model, organizational theory provides a powerful lens through which to examine the transformation. In applying the insights gained, the restructuring must remain cognizant of the vastly different natures between the political/military and commercial environments. By acknowledging these differences while integrating the organizational theory findings, the post-industrial army can effectively flatten its force structure while creating a powerful and robust organization.

Appendix 1

Military Force and Military Effort

In February of 2000, the army published FM 100-5, *Operations – Content Summary.* The doctrinal summary for Full Spectrum Operations addresses four types of military operations: offensive, defensive, stability, and support

Range of Army Operations						
Military Operations	General U S Goal		Offense	Defense	Stability	Support
War	Fight and Win War	M T W				B A S E D
Military Operations Other Than War	Deter War and Resolve Conflict	S S C				on
	Promote Peace	P M E				N E E D

MTW -Major Theater of War
SSC - Smaller Scale Contigency
PME - Peacetime Military Engagement

(ODSS).[58] The manual further outlines the range of army operations. After a brief discussion of the four types of operations, the manual emphasizes the capability of army forces to rapidly transition from offensive or defensive operations to stability operations or support operations and back again.

Training and Doctrine Command (TRADOC) framed this new outline for the field army to align army doctrine better with the nature of current operations. The field army assessed a shortfall in the current 1993 version of FM100-5. Focused on "fighting and winning the nation's wars", the current FM 100-5 fails to

provide commanders and staffs adequate guidelines for conducting operations along the entire continuum of political/military operations. The 1993 doctrine clearly lacks an appreciation for the center of this continuum where political considerations carry substantially more weight than military considerations – the venue of military effort.

The application of military effort differs from the application of military force in two primary ways – the primacy of considerations and the character of the military force involved. The interaction of these two factors significantly complicates the employment of military effort. Military operations requiring the employment of military effort present commanders and their staffs with complex problems: the most difficult problem in applying military effort involves effectively translating political goals and objectives into military objectives.

Military organizations apply effort primarily in operations supporting diplomacy, diplomacy backed by threat, and diplomacy backed by force. In these environments, political considerations take primacy over military considerations. These operations clearly demonstrate the Clausewitzian hierarchy of objectives. The limited political objectives sought constrain the military actions taken. These constraints include a restriction of the use of military force outlined in the rules of engagement.

The limited political objectives sought often translate into a strategy of deliberate ambiguity. "Its purpose [is] to threaten decisive military action without provoking or suffering through it."[59] In support of this ambiguity, military effort – the employment of forces without the application of force – becomes the sole

51

military objective. The dilemma for the military commander resides in adequately protecting the force while actively supporting the political objective.

In executing operations in Kosovo in 1999, General Clark outlined the continuum of political/military operations according to figure three.
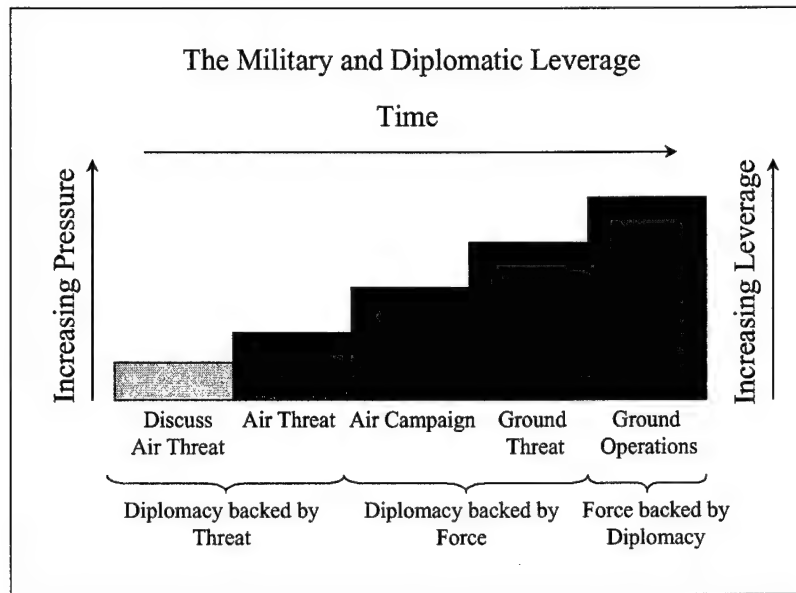

The Military and Diplomatic Leverage

Time

Increasing Pressure

Increasing Leverage

| Discuss Air Threat | Air Threat | Air Campaign | Ground Threat | Ground Operations |

Diplomacy backed by Threat   Diplomacy backed by Force   Force backed by Diplomacy

Figure Three

According to then-Captain Clark, political considerations justifiably constrain military actions taken short of ground operations. If ground operations requiring military violence commenced, he advocated challenging political efforts to impose political constraints that reduce the military impact of coercive measures. Clark linked this shift with ground actions because reliance on air and naval forces often prove unsatisfactory since their employment has a degree of reversibility not possible with land forces.[60] General Clark reaffirmed his views when forced to live his monograph.[61]

The primacy of political considerations during operations requiring the application of military effort influence the character of the forces employed. The employment of land forces signals the commitment of the nation to attaining political objectives without the overt employment of force. To effectively establish this land presence, quantity maintains a quality of its own. Military commanders and staffs direct soldier activities on the ground towards achieving the political objective sought. Presence and action contribute to mission accomplishment. Force or the threat of force may hinder mission success.

While no clear line separates the employment of military effort and force, some conclusions can be drawn. Political considerations carry greater weight in the application of military effort. This military effort generally translates into land forces establishing a presence on the ground. Although political constraints initially limit military actions, the military force employed must retain the ability to quickly transition to force application.

[1] This section will draw heavily on the teachings of Dr. James Schneider, Professor of Military Theory at the School for Advanced Military Studies (SAMS). During Dr. Schneider's SAMS elective, Technology and War, many of the concepts discussed in this section were introduced.

[2] Notes from SAMS Elective: Technology and War, 4 January 2000.

[3] The monograph will focus on the impact of these two factors on western civilization for two reasons. First, as a member of a modern western military, this study will increase my understanding of how these factors shaped our history and presage our future. Second, western militaries epitomize the integration of technology and the development of the military art.

[4] Notes from SAMS Elective: Technology and War, 4 January 2000.

[5] Notes from SAMS Elective: Technology and War, 4 January 2000.

[6] Notes from SAMS Elective: Technology and War, 4 and 7 January 2000.

[7] David W. Tschanz, "Gauis Marius – Seeds of Change," [http://www. Strategypage.com/articles/default.asp?/target=marius/seedsof change.htm], 3.

[8] David W. Tschanz, "Gauis Marius – Marius' Mules," [http:// www. Strategypage.com/articles/default.asp?/target=marius/mariusmules.htm], 1.

[9] Lynn White, Jr. *Medieval Technology and Social Change*, 3.

[10] Ibid, 4-11. White discusses Heinrich Brunner's ideas concerning Charles Martel and the introduction of feudalism into European society. While White dismisses the proposition that the Arab incursion generated feudalism, he accepts Brunner's contention that Martel seized Church lands and granted endowments in exchange for mounted military service. "The requirements of the new mode of warfare which it [the stirrup] made possible found expression in a new form of western European society dominated by an aristocracy of warriors endowed with land so that they might fight in a new and highly specialized way." Pg. 38.

[11] Notes from SAMS Elective: Technology and War, 4, 7 and 11 January 2000.

[12] Department of the Army, *FM 100-5* (Washington, DC: Government Printing Office, 1993). The monograph uses the *FM 100-5* definition of operational art in this discussion. This definition establishes the different nature of military operations of Industrialized nations. The essence of this definition requires military commanders to determine when, where, and for what purpose forces fight over time to link battles and engagements into campaigns and major operations. Through this process, commanders orchestrate military operations to achieve strategic goals.

[13] Richard E. Beringer, Herman Hattaway, Archer Jones and William N. Still, Jr. *Why the South Lost the Civil War*, 17.

[14] Ibid, 236-267. This monograph does not dispute the conclusions of these authors. If as the authors claim "The epitaph on the Confederacy's tombstone should read, 'Died of Guilt and Failure of Will'", this author feels the operational art employed by Grant and Sherman played a more prominent part in inducing this failure.

[15] For stylistic purposes, organizational behavior/development and management/leadership fields of study will be abbreviated as organizational and leadership respectively.

[16] Judith R. Gordon, *A Diagnostic Approach to Organizational Behavior,* (Boston, MA: Allyn and Bacon, 1993), 15. Gordon goes on to point out the influence of economist Adam Smith in the development of management theory. In *An Inquiry into the Nature and Cause of the Wealth of Nations,* Smith's perspective on the division of labor "laid the foundation for later theories that were concerned with the structure of organizations and work."

[17] Ibid, 16-18.

[18] Ibid, 16-18. Taylor characterized four managerial responsibilities: develop a science for each element of a man's work; scientifically select and train each worker; heartily cooperate with the men; and equally divide the work and responsibility between management and the workers. Fayol outlined fourteen Principles of Management. 1) Division of work – the specialization of work. 2) Authority – "the right to give orders, and power to exact obedience." 3) Discipline – "obedience, application, energy, behavior, and outward marks of respect." 4) Unity of command – "an employee should receive orders from one superior only." 5) Unity of direction – "one head and one plan for a group of activities having the same objective." 6) Subordination of individual interests to the general interest – the interest of an individual or group should not supersede the

organization's concerns. 7) Remuneration – fair payment for services. 8) Centralization – degree of consolidation of management functions. 9) Scalar chain (line of authority) – "the chain of superiors ranging from the ultimate authority to the lower ranks." 10) Order – all materials and people should be in an appointed place. 11) Equity – equality of (although not necessarily identical) treatment. 12) Stability of tenure of personnel – limited turnover of personnel. 13) Initiative – "thinking out a plan and ensuring its success." 14) Esprit de corps – "harmony, union among the personnel of a concern." Weber outlined six Principles of Bureaucracy: specified and official areas of responsibility based on knowledge; orderly system of supervision and subordination; unity of command; extensive use of written documents; extensive training in job requirements; and application of consistent and complete rules.

[19] Ibid, 16-18.

[20] Judith R. Gordon, *A Diagnostic Approach to Organizational Behavior*, 18-20. The group dynamics school examined the impact of the work group and the relationship between organizational effectiveness and group formation, development, behavior, and attitudes. The leadership school focused their research on the roles of managers and leaders in organizations. They developed the task/social leader model, which distinguished between leaders who focus on task accomplishment versus leaders who focus on group cohesiveness and collaboration. They also developed the Theory X/Y model. Theory X leaders assume workers have an inherent dislike of work, while Theory Y leaders assume people enjoy work. Finally, the decision-making school challenged the rational behavior model of decision making that developed from the bureaucratic model. The new model asserted that individuals *satisfice*. Rather than looking at all available solutions and choosing the optimal choice, people examine a limited number of options before accepting a "good enough" option.

[21] Ibid, 21.

[22] Ibid, 21.

[23] Ibid, 21-23. I've summarized Gordon's analysis of the systems theory of organizational theory.

[24] Ibid, 23.

[25] Ibid, 23-24.

[26] Bernard M. Bass, *Bass and Stogdill's Handbook of Leadership – Theory, Research and Managerial Application* (New York: The Free Press), 55.

[27] Joseph C. Rost, *Leadership for the Twenty-First Century* (Westport, CT: Praeger Publishers), 27.

[28] Ibid, 94.

[29] Ibid, 145.

[30] Ibid, 103.

[31] Kathleen E. Allen, "Making Sense Out of Chaos: Leading and Living in Dynamic Systems", 57.

[32] Ibid, 57.

[33] Gary Zukav, *The Dancing Wu Li Masters – An Overview of the New Physics* (New York: Bantam), 20. According to Zukav, "Newton's laws depict events which are simple to understand and easy to picture."

[34] Ibid, 28.

[35] Ibid, 27.

[36] Wheatley, *Leadership and the New Science – Learning about Organization from an Orderly Universe* (San Francisco, CA: Berrett-Koehler Publishers, Inc), 35. Heisenberg's uncertainty principle, or the Principle of Complementarity precludes objectivity because the observer's relationship with the observed influences what occurs.

[37] Ibid, 37.

[38] Ibid, 39.

[39] Ibid, 104.

[40] Ibid, 37.

[41] Wesley K. Clark, "Military Contingency Operations: The Lessons of Political-Military Coordination" (Leavenworth: US Army Command and General Staff College, 1975), 15. Then-Captain Clark quoted Henry Kissinger from an article in the New York Times, 27 July 1956, p1.

[42] Ibid, 33-51. Clark outlined a Rational Political-Military Decision-Making Model. This hierarchy of decision-makers (or decision-making agencies) progresses from those dictating national

strategy, to those making diplomatic, military, or economic strategy (today we include informational), to those responsible for tactical military decisions. Tension resides within this hierarchy as each level attempts to understand the decisions and their impact throughout the hierarchy. The intrinsic layering of tactical military decision-making generates greater possibilities for misunderstanding. Additionally, like Shimon Naveh recognized in his work, *In Pursuit of Military Excellence,* a tension exists between the tactical and operational decision-making considerations. Continuous media coverage of this hierarchy of decision-makers both highlights and compounds the interrelationship of these decision-makers and their decisions.

[43] Ibid, 140.

[44] Handouts provided by General Wesley K. Clark during a 7 December 1999 breakfast discussion with SAMS students several months after operations in Kosovo terminated.

[45] Clark, *Military Contingency Operations: The Lessons of Political-Military Coordination,* 144.

[46] Creighton W. Abrams, "Mobility Vs Firepower – An Individual Study", *The Art of War Quarterly –Volume III* (February, 1984), 99.

[47] Ibid, 99.

[48] Ibid, 109.

[49] Ibid, 102.

[50] Ibid, 104.

[51] Ibid, 106.

[52] Ibid, 106.

[53] Ibid, 106.

[54] Ibid, 107.

[55] Ibid, 107.

[56] Ibid, 112.

[57] General Clark handouts.

[58] FM 100-5, *Operations – Content Summary,* (Washington, DC: Government Printing Office, 2000), 9.

[59] Clark, *Military Contingency Operations: The Lessons of Political-Military Coordination,* 144.

[60] Ibid, 149.

[61] Remarks of General Clark during his 7 December 1999 talk with SAMS students following operations in Kosovo.

BIBLIOGRAPHY

Books

Bass, Bernard M. *Bass & Stogdill's Handbook of Leadership – Theory, Research, & Managerial Applications.* New York: The Free Press, 1990.

Bellamy, Christopher. *The Evolution of Modern Land Warfare - Theory and Practice.* London, England: Routledge, Chapman, and Hall, Inc, 1990.

Birdzwell, L. E., Jr., and Nathan Rosenberg. *How the West Grew Rich – The Economic Transformation of the Industrial World.* United States of America: Basic Books, Inc., 1986.

Brown, Donald R. and Don Harvey. *An Experiential Approach to Organization Development.* Upper Saddle River, New Jersey: Prentice Hall, 1996.

Clausewitz, Carl von. *On War.* Edited and translated by Michael Howard and Peter Paret. Princeton, New Jersey: Princeton University Press, 1976.

Durch, William J., ed. *UN Peacekeeping, American Policy, and the Uncivil Wars of the 1990s.* New York: St. Martin's Press, 1996.

Gordon, Judith R. *A Diagnostic Approach to Organizational Behavior.* Boston, MA: Allyn and Bacon, 1993.

Handel, Michael I. *Clausewitz and Modern Strategy.* London, England: Frank Cass and Company, 1986.

Hawking, Stephen. *A Brief History of Time.* New York: Bantam Books, 1996.

Kelly, Kevin. *Out of Control.* New York: Addison-Wesley, 1995.

Leonhard, Robert R. *Fighting by Minutes – Time and the Art of War.* West Port, Connecticut: Praeger Publishers, 1994.

Marx, Leo and Merritt Roe Smith, eds. *Does Technology Drive History? The Dilemma of Technological Determinism.* Cambridge, MA: Massachusetts Institute of Technology Press, 1995.

Naveh, Shimon. *In Pursuit of Military Excellence – The Evolution of Operational Theory.* Portland, Oregon: Frank Cass Publishers, 1997.

Rost, Joseph C. *Leadership for the Twenty-First Century.* Westport, CT: Praeger Publishers, 1991.

Senge, Peter M. *The Fifth Discipline - The Art & Practice of The Learning Organization.* New York: Doubleday, 1990.

Simpkin, Richard E. *Race to the Swift – Thoughts on Twenty-First Century Warfare.* New York: Brassey's Defence Publishers, 1985.

Wheatley, Margaret J. *Leadership and the New Science – Learning about Organization from an Orderly Universe.* San Francisco, CA: Berrett-Koehler Publishers, Inc., 1992.

White, Lynn, Jr. *Medieval Technology and Social Change.*

Zukav, Gary. *The Dancing Wu Li Masters – An Overview of the New Physics.* New York: Bantam, 1980.

Internet Sources

Tschanz, David W., "Gauis Marius – Marius' Mules." Available online: 17 January 2000. [http://www.Strategypage.com/articles/default.asp?/target=marius/mariusmules.htm]

Tschanz, David W., "Gauis Marius – Seeds of Change." Available online: 17 January 2000. [http://www.Strategypage.com/articles/default.asp?/target=marius/seedsofchange.htm]

Articles and Periodicals

Anderson, Gary. Urban Warfare: Russia Shows What Not to Do. *The Wall Street Journal,* 25 January, 2000, A18.

Cohen, Eliot A. At Arms. *National Review,* 24 January (2000), 26-28.

Melloan, George. AOL is Great, but the Medium *Isn't* the Message. *The Wall Street Journal,* 18 January, 2000, A27.

Hartzog, William W. "A Changing Army," *Army,* February (2000): 10-19.

Odom, William E. Why the Chechens are Winning. *The Wall Street Journal,* 28 January, 2000, A18.

Schneider, James J., and Lawrence L. Izzo. "Clausewitz's Elusive Center of Gravity," *Parameters* 14, September (1987): 46-57.

Government Documents

Clinton, William J. *A National Security Strategy for a New Century.* Washington, DC: Government Printing Office, 1998.

Department of the Army. *FM 100-5 Operations.* Washington, D C: Government Printing Office, 1993.

Department of the Army. *FM 100-5 Operations (DRAFT).* Washington, D C: Government Printing Office, 1997.

Department of the Army. *FM 100-5 Operations – Content Summary).* Washington, D C: Government Printing Office, 2000.

Department of the Army. *FM 100-7 Decisive Force: The Army in Theater Operations.* Washington, D C: Government Printing Office, 1995.

Theses, Studies, and Other Papers

Bailey, Jonathan. "The First World War and the Birth of the Modern Style of Warfare." The Occasional Paper No 22, Strategic & Combat Studies Institute, 1996.

Clark, Wesley K. "Military Contingency Operations: The Lessons of Political-Military Coordination." US Army Command and General Staff College, 1975.

Menning, Bruce W. "An Operator/Planner's Introduction to Operational Art."

Schneider, Dr. James J. "The Theory of Operational Art." Theoretical Paper No 3, School of Advanced Military Studies, US Army Command and General Staff College, 1988.

Schneider, Dr. James J. "Vulcan's Anvil: The American Civil War and the Emergence of Operational Art." Theoretical Paper No 4, School of Advanced Military Studies, US Army Command and General Staff College, 1991.